

REMARKS

The specification has been amended to correct certain inadvertent errors as pointed out by the Examiner. Accordingly, it is believed that the Examiner's objection to the specification has been eliminated.

Claims 1-3 and 5 have been rejected by the Examiner under 35 U.S.C. §102(a) as being anticipated by Sugimoto et al. (USP 6,045,459). Also, claim 4 has been rejected by the Examiner under 35 U.S.C. §103(a) as being unpatentable over Sugimoto et al. in view of Hayashi et al. (USP, 6,117,026). These rejections are respectfully traversed.

The present invention appears to be directed to a multi-piece golf ball having a soft and good shot feel, and having excellent flight performance by accomplishing high rebound characteristics and a high launch angle when hit by golfers regardless of either the club head speed at which the ball is struck or the club which is used. This is accomplished by adjusting the diameter, center hardness and hardness distribution of the inner core, the thickness and surface hardness of the outer core, the hardness distribution of the core being within a specified range.

Specifically, the invention is directed to a multi-piece golf ball with an inner core and an outer core formed thereon wherein the inner core has a diameter of 30 to 40.4 mm; a surface hardness in JIS-C hardness of 60 to 85, and a center hardness in which the JIS-C hardness is lower than the surface hardness by 5 to 30. The outer core has a thickness of 0.2 to 1.3 mm and a surface hardness in JIS-C hardness, which is lower than the surface hardness of the inner core by 2 to 30. Finally, it is preferable that the outermost layer of the cover have a thickness of 1.0 to 3.0 mm and a surface hardness in Shore D hardness of 58 to 75, and the outer core have a thickness of 0.2 to 0.9 mm.

The Examiner relies upon Sugimoto to show a three-piece solid golf ball structure very similar to that of the present invention. However, it appears that in Sugimoto, the inner layer core center hardness is greater than the surface hardness of the inner layer core, as set forth in claim one. This is the opposite of the present invention, which claims an inner layer core center hardness which is "lower than the surface hardness by 5 to 30." [Claim 1].

Thus, the golf ball of the Sugimoto et al. reference exhibits poor shot feel, particularly for a golfer having medium

or low club head speed, because the golf ball of the Sugimoto et al. reference is not easily deformed when hit and requires a much stronger force to deform the golf ball because of its hardness distribution. Thus, the golf ball of the Sugimoto et al. reference is not effective with respect to shot feel for golfers having a low club head speed whereas, because of the hardness distribution, the golf ball of the present invention achieves a soft and good shot feel regardless of either the club head speed at which the ball is struck or the club which is used. Accordingly, the Sugimoto et al. reference fails to achieve the advantageous results of the golf ball of the present invention.

In rejecting claim 4 under 35 U.S.C. §103(a), the Examiner is relying upon the Hayashi et al. patent to use a golf ball having an outer core with a thickness of 0.2 to 0.9 mm for optimizing resilience and shot feel. Although the Hayashi et al. patent shows an outer core thickness similar to the golf ball of the present invention, this is where the relevancy ends inasmuch as the multi-piece golf ball of the present invention is substantially and structurally different from the golf ball of the Hayashi et al. patent. More specifically, the Hayashi et al. patent does not show the Shore D hardness values of the inner core, outer core or the

cover and certainly does not suggest that the inner core has a surface hardness of 60 to 85 and a center hardness lower than the surface hardness by a factor of 5 to 30. Similarly, there is no recognition that the outer core has a surface hardness lower than the surface hardness by a factor of 2 to 30. In fact, when comparing the golf ball of the Hayashi et al. patent with that of the present invention, we are discussing two completely different golf balls. Thus, to merely carve out one feature or one aspect of the golf ball of the Hayashi et al. patent in an effort to suggest the subject matter of claim 4 of the present invention, in effect, reconstructs the teachings of the reference in view of the Applicants own disclosure. Even if, *arguendo*, it would be possible to combine the Hayashi et al. patent with the Sugimoto et al. patent as suggested by the Examiner, said combination would still not suggest an important feature of the present invention as recited in claim 1 of the present application, wherein the center hardness of the inner core is lower than the surface hardness by a factor of 5 to 30.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number below,

to conduct an interview in an effort to expedite prosecution in connection with the present application.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

Pursuant to 37 C.F.R. § 1.17 and 1.136(a), Applicants respectfully petition a three (3) month extension of time for filing a response in connection with the present application. The required fee of \$890.00 is attached hereto.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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By 

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Attachment: Version with Markings to Show Changes Made

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

In the Specification:

Please replace the first full paragraph beginning on page 16, lines 1-12, with the following rewritten paragraph:

--In the present invention, it is required that the surface hardness of the outer core **2** is [higher] lower than the surface hardness of the inner core **1** by 2 to 30, preferably 4 to 20, more preferably 5 to 15. When the hardness difference is smaller than 2, the shot feel is hard and poor, particularly the shot feel when hit by a short iron club and putter is poor. On the other hand, when the hardness difference is larger than 30, the rebound characteristics are degraded. In addition, the deformation amount at the time of hitting is large, and the spin amount is large, which reduces the flight distance.--

Please replace the paragraph bridging pages 18-19 (page 18, lines 22-25 and page 19, lines 1-23), with the following rewritten paragraph:

--The cover **3** of the present invention contains thermoplastic resin, particularly ionomer resin, which has been conventionally used for the cover of golf balls, as a base resin. The ionomer resin may be a copolymer of ethylene and  $\alpha,\beta$ -unsaturated carboxylic

acid, of which a portion of carboxylic acid groups is neutralized with metal ion, or a terpolymer of ethylene,  $\alpha,\beta$ -unsaturated carboxylic acid and  $\alpha,\beta$ -unsaturated carboxylic acid ester, of which a portion of carboxylic acid groups is neutralized with metal ion. Examples of the  $\alpha,\beta$ -unsaturated carboxylic acid in the ionomer include acrylic acid, methacrylic acid, fumaric acid, maleic acid, crotonic acid and the like, preferred are acrylic acid and methacrylic acid. Examples of the  $\alpha,\beta$ -unsaturated carboxylic acid ester in the ionomer include methyl ester, ethyl ester, propyl ester, n-butyl ester and isobutyl ester of acrylic acid, methacrylic acid, fumaric acid, maleic acid, crotonic acid and the like. Preferred are acrylic acid esters and methacrylic acid esters. The metal ion which neutralizes a portion of carboxylic acid groups of the copolymer or terpolymer includes a sodium ion, a potassium ion, a lithium ion, a magnesium ion, a calcium ion, a zinc ion, a barium ion, an aluminum ion, a tin ion, a zirconium ion, cadmium ion, and the like. Preferred are sodium ions, zinc ions, magnesium ions and the like, in view of rebound characteristics, durability and the like--

In the Claims:

Please amend the claims as follows:

1. (Amended) A multi-piece solid golf ball comprising a core consisting of an inner core and an outer core formed on the inner core, and one or more layers of cover covering the core,

wherein the inner core has a diameter of 30 to 40.4 mm, [and] a surface hardness in JIS-C hardness of 60 to 85, and a center hardness in JIS-C hardness of the inner core is lower than the surface hardness by 5 to 30, and

the outer core has a thickness of 0.2 to 1.3 mm, and a surface hardness in JIS-C hardness of the outer core is lower than the surface hardness of the inner core by 2 to 30.